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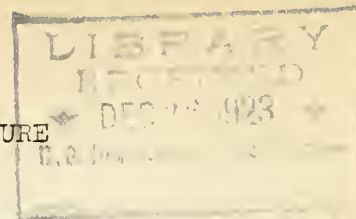
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THE GERMAN FAT AND OIL SITUATION

By

E. C. Squire,
Agricultural Commissioner, Berlin, Germany.

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P R E F A C E

The shortage of fats in Germany was so acute during the war that thorough research was made of the pre-war sources of supply, with the result that available figures for the year 1912 and 1913 constitute a reasonably accurate basis for post-war comparison. In all references to pre-war years or to 1912-1913, in this report, therefore, it should be understood that an average of the years 1912 and 1913 is the figure taken. The indications herein given for these years have been officially checked by the German Department of Agriculture for all fats of German origin, and also for vegetable oil supplies, and the total of the table for German fat supplies (See Table 1) checks with the figure commonly stated to have been available in pre-war years. No such research has been made for the year 1922, but the German Department of Agriculture has assisted in making estimates, which have been adopted for German animal fat production, butter and slaughtering fats included, and for vegetable oil production from domestic seeds.

Fats obtained in pre-war years from the consumption of milk, cheese, grain, and foods other than those herein mentioned, are not considered in this report, although it is estimated that 25% of the total fat consumed was derived from these sources. The indications for 1922 are that such supplies of fats have decreased at least as much as the other fats which are considered in this report.

It should be borne in mind in the reading of this report that all figures obtained from German sources are preliminary and subject to revision.

E. C. Squire,
Berlin, June 12, 1923.

THE GERMAN FAT AND OIL SITUATION.

By E. C. Squire, Agricultural
Commissioner, Berlin, Germany.

Revolutionary changes in the German fat and oil industry during and since the war may have an important bearing upon the future profitability of several products of American agriculture.

There has been a considerable reduction in supplies of fats in Germany since the beginning of the war. No data are available to show how low the supplies fell during the war. There have been some improvements in supplies since the war but they are still low. The best available data indicate that the total supply for 1922 was only 70 per cent of the total supply for 1912-13. The reduction of the population from 68,000,000 in 1912-13 to 60,000,000 in 1922 reduced the need for fats but the per capita supply was only 80 per cent of the prewar supply. There has undoubtedly been some reduction in total consumption of fats during 1923.

Germany produces a smaller proportion of her total fat supplies than she produced before the war. In 1912-13 fifty-eight per cent of the German fats and oils were home produced from domestic animals, home grown seeds, and other materials from which the fats had not been extracted. In 1922 home production constituted only 49 per cent of the total supply.

Decreased importance of domestic supplies was due to the decline in animal fats, since vegetable oils showed an increase of 33 per cent. The production of hog fats alone decreased 55 per cent in comparison with 1912-13. Beef fats and butter declined about 33 per cent for the same period. Total German production of all fats decreased a little over 40 per cent.

TABLE I.

COMPARATIVE TABLE OF THE MOST IMPORTANT GERMAN FAT SUPPLIES.

	1912-1913	1922	Change + %
<u>GERMAN PRODUCTION</u>	Short tons	Short tons	
<u>Animal Fats</u>			
Hog fat	584,000	265,000	-54.6
Butter	441,000	292,000	-33.8
Beef fat	187,000	127,000	-32.1
Rendering fats (from refuse, bones, etc.) a:	17,000	17,000	--
<u>Total animal fats</u>	1,279,000	701,000	-43.0
<u>Vegetable Fats</u>			
Oil from German seeds..:	33,000	44,000	+33.3
<u>Total German production</u>	1,262,000	745,000	-41.0
<u>IMPORTED SUPPLIES</u>			
<u>Animal Fats</u>			
Hog Fat:			
Lard.....	118,000	72,000	-39.0
Fat from fresh pork :	7,000	2,750	-60.7
Fat from bacon.....:	1,600	22,600	+1312.5
<u>Total Hog Fat</u> ...:	126,600	97,350	-23.1
Butter.....	61,000	1,180	-98.1
Butter from imported cream.....	15,400	-100.0
Premier Jus and Oleo b:	50,000	22,000	-56.0
Tallow and bone fat b:	21,000	40,000	+90.5
<u>Total Animal Fats:</u>	274,000	160,530	-41.4
<u>Fish Oil and Fat b</u>	53,000	69,000	+30.2
<u>Vegetable Fats</u>			
Oil and oil from raw: materials b.....:	595,000	551,000	-7.4
<u>Total Imported Supplies</u>	922,000	780,530	-15.3
<u>Total all supplies</u>	2,184,000	1,525,530	-30.1

a - inedible.

b - minus exports.

Imported supplies, it has been indicated, increased in relative importance from 42% to 51% of total supplies. The actual volume of imports decreased 15%, however, most of the decline being due to smaller imports of animal fats. Vegetable fats also declined slightly. Fish fat imports on the other hand, increased 30%.

Probably the most significant change since the beginning of the war is the replacing of animal fats, pork fats in particular, with other and cheaper fats, chiefly from vegetables. The relative position of pork fats has declined from 33 percent of the total in 1912-13. to 24 per cent in 1922. The per capita use of pork fats has decreased about 42 per cent, whereas the use of all fats and oils has decreased only about 20 per cent.

These changes have special significance for the United States because of the importance of the German market for American fats. They are also of importance because of the fact that our exports of these products have always been almost entirely confined to animal fats, of which 75 to 80 per cent were pork fats. Furthermore, the tendency toward substituting vegetable fats for animal fats now apparent in Germany may foreshadow greater similar developments throughout the fat and oil trade.

The changes that have taken place, it will be observed, have been, primarily, changes relating to quantities and kinds of fats and oils figuring in the trade. Changes in the quantities of fats have been, essentially, the result of decreased production of fats within Germany. Substitution of vegetable and fish fats for animal fats, and other changes in kinds of fats, have been to a considerable extent a matter of economy, but have also been perhaps equally due to decreased production of animal fats.

The key to the fat and oil situation, in many respects, seems to be the dairy industry. Changes in the condition of that industry are reflected in practically every branch of the fat and oil trade.

Increased or decreased production of butter, especially under prevailing economic conditions, affects the production of margarine. Requirements for margarine materials in turn determine, to a large extent, the amount of beef, fish and vegetable fats that will be imported. Domestic production of beef fats is quickly influenced by the dairy situation in that cattle production in Germany is essentially dairy in character. The market for pork fats, lard in particular, is probably also somewhat affected, although to a smaller degree.

The dairy situation, however, should serve to forecast the probable trend of domestic hog production. Both are closely dependent, particularly at the present time, upon the success of German harvests. Of the two, the dairy trade is probably the most sensitive to a favorable or an unfavorable outlook. To a certain extent, moreover, the hog industry, as in Denmark, is a side line for the dairy business. In any event, both industries are subject to the same influences.

The first subject to be considered in this report is that of butter production.

BUTTERPre-war Situation:

Actual statistics do not exist, but it has been estimated that German butter production averaged 440,000 tons per year for 1912 and 1913. Professor Kirchner, an expert in dairy questions, has estimated it at about 400,000 tons; and the statisticians Kuczinski and Zuntz at 440,000 tons, while other authorities have indicated higher figures, but the amount indicated above is quite generally used, and the German Ministry of Agriculture has checked it as being a fair one.

In addition to the prewar home produced butter, there was an increasing import chiefly from Russia (see table No. 2), which amounted in years just prior to the war to about 61,000 tons.

Also because of certain German custom regulations, between 44 - 55,000 tons of cream annually, entered the country. This was used almost entirely for making butter. The industry was located at Warnemunde, Lubeck and other towns in that section near Denmark. Butter production from imported cream amounted to about 15,400 tons per year.

German butter consumption in 1912-13 was about 517,000 tons or 15.2 pounds per person for the 68 million inhabitants.

Situation in 1922.

For the year 1922 the German Department of Agriculture indicates, that butter production probably amounted to 292,000 tons. Home production was supplemented by an importation of only 1180 tons from other countries, with practically no importation of cream for butter-making purposes. This indicates a total butter consumption in 1922 of 293,290 tons or a per

capita consumption of 9.78 pounds on the basis of a population of 60,000,000 people in the present German territory. While this estimate shows that total butter supplies per capita in 1922 were about 36% below pre-war supplies, the shortage has existed largely in the cities, and accordingly has been intensified there.

The indication given by the German Department of Agriculture for 1922 is based upon the decreased number of cows and the decreased milk production as compared with pre-war years. The number of cows in the old German territory in 1912 was about 10.2 million, while on December 1st, 1922, it was only 8,159,828 - a decrease of 20%. Milk production per cow, furthermore, is estimated to have decreased 25%.

These two indications would point to about 265,000 tons of butter production, and many people consider this a correct figure. But taking into consideration the fact that butter was a better paying product than cheese or fresh milk, the price for the latter being closely controlled by the various cities, the estimate of 292,000 tons can be accepted as more nearly accurate. This comparatively high butter production has undoubtedly been reached at the expense of cheese and fresh milk, as the milk available for human consumption, whether for butter, cheese or as fresh milk, was only a little over one half of that available in 1912-13 according to other Government indications.

MILK

Although the milk available for human consumption in 1922 was only a little over half of that available in 1912-13, the German Ministry of Agriculture frankly admits that the rural population is consuming as much milk and butter and possibly more than in pre-war days. This situation has been brought about by the fall of the mark. As the currency has depreciated, country laborers have demanded their wages in agricultural produce,

and the more permanent classes now receive practically all their wages in this form. 3.

Table 2.

GERMAN TRADE IN MILK, CREAM, AND MILK PRODUCTS.
(Tons of 2,000 Pounds).

Item.	Year.	Imports.	Exports.	Net import or export.	Milk equivalent.
Milk	1912	47,429	12,967	Import 34,462	34,462
	1913	36,144	13,724	" 22,420	22,420
	1922	10,573	6,057	" 4,516	4,516
Cream	1912	46,241	50	" 46,191	230,955
	1913	48,914	28	" 48,886	244,430
	1922	14	--	" 14	70
Butter Milk	1912	298	4,483	Export 4,185	(1)
	1913	15	4,738	" 4,723	
	1922	--	--	--	
Milk (Dried and prepared)	1912	29	5,128	" 5,099	(2) 25,495
	1913	57	9,101	" 9,044	45,220
	1922	4,647	511	Import 4,136	20,680
Cheese (Solid)	1912	21,494	56	" 21,438	214,380
	1913	26,740	143	" 26,597	265,970
	1922	20,850	176	" 20,674	206,740
Cheese (Soft)	1912	2,145	850	" 1,295	12,950
	1913	2,211	659	" 1,552	15,520
	1922	5,142	942	" 4,200	42,000
Butter	1894	7,716	8,598	Export 882	13,522
	1908	38,029	243	Import 37,786	793,506
	1909	49,350	231	" 49,119	1,031,499
	1910	46,407	198	" 46,209	970,368
	1911	61,839	276	" 61,563	1,292,823
	1912	61,288	243	" 61,045	1,281,945
	1913	59,745	298	" 59,447	1,248,387
	1922	1,179	309	" 870	13,270

(1) Buttermilk a by-product - milk equivalent not expressed.

(2) Equivalent taken as five pounds of milk to one of dried or prepared.

Factors affecting Production and Demand.

It is trite to say that increased demand for butter in Germany will be contingent upon improvement in the nation's general economic condition, but the factors upon which increased supply depend are not quite so obvious, yet they are capable of more exact definition. The existing deficiency in supply can be attributed to the following causes:-

1. Decreases in the number of cattle:

a. Losses through the Treaty of Peace which involved a slightly larger proportion of animals, including cattle, than of population.

b. Decreases in imports of cattle.

c. Slaughtering.

2. Diminished supply of cattle foods:

a. Loss by the Treaty of a relatively large proportion of the surplus grain producing area.

b. Decrease in the import surplus of concentrates and oil cake.

c. Low post-war grain yields per acre.

The situation in 1922 with respect to the number of cows is shown in the tabulation below. It is to be noted that although the number and imports of cows had greatly decreased, slaughtering was nearly as high as before the war.

Table 3.

Cow Statistics - All of Germany

1913 and 1922						
Item	:	1913	:	1922	:	Decrease
						Number : Per Cent
Number of cows	:	10,555,000	:	8,139,828	:	2,415,172: 22.9
Imports of cows	:	259,400	:	52,285	:	207,115: 79.8
Slaughter of cows	:	1,633,561	:	**1,422,478	:	211,083: 12.9

** Excluding the Saar. (See tables 13, 14)

Assuming that land was cultivated and cows were distributed according to the greatest economy in 1913, it is apparent from the following tabulation that Germany suffered by Treaty a greater proportional loss of grain producing area than of milch cows.

Table 4

Loss By Treaty of Land under cultivation and milch cows					
Item	: Original : Boundaries : in 1913	: Present : Boundaries : in 1913	: Loss : by : Treaty	: Loss : in : Per Cent	
Acres	: 85,579,873	: 72,117,000	: 13,462,873	: 15.73	
Cows	: 10,555,000	: 9,475,000	: 1,080,000	: 10.23	

This would hold true after the war providing there was no substantial decrease or redistribution of cultivation and cows during the war period. But changes naturally took place. The tabulation below shows that cultivation in 1922 was only slightly below the pre-war figure for the same area, while the number of cows had decreased considerably. This change tended to compensate for the greater loss of acreage under the terms of the Treaty.

Table 5

Decrease in Acreage under Cultivation and Number of milch cows. Present area - 1922 compared to 1913.					
Item	: Present : Boundaries : in 1913	: Present : Boundaries : in 1922	: Decrease : in : Number	: Decrease : in : Per Cent	
Acres	: 72,117,000	: 69,041,000	: 3,076,000	: 4.3	
Cows	: 9,475,000	: 8,139,828	: 1,335,172	: 14.1	

Considering Germany as a whole, the total number of cows in 1922 had decreased a little more than the total amount of land under cultivation in comparison with 1913 totals for both units. (See Table 6 below).

Shortage of feed must have been due, then, to decreased yield. Population, it will be observed decreased to a less extent than either of the above items.

Table 6

Decrease in Acreage, Milch Cows and Population. All Germany - 1913 and 1922.						
Items	: Original : Boundaries : in 1913	: Present : Boundaries : in 1922	:	Decrease : in : Number	:	Decrease : in : Per Cent
Acres	: 85,579,873	: 69,041,000	:	16,538,873	:	19.33
Cows	: 10,555,000	: 8,139,828	:	2,415,172	:	22.88
Population	: 68,000,000	: 60,000,000	:	8,000,000	:	11.76

The following tabulation shows production per acre of the principal crops, These figures, however, must be taken with reservations:-- (1)

Table 7

Principal Crops - Acreage, Production and Yield							
Crop	:	1913 (a)			:	1922	
	:	Area	: Production:	Yield	:	Area	: Produc- : Yield
	:	1000	: 1000 Tons	per	:	1000	: tion : per
	:	acres	: or bu.	: acre	:	acres	: : acre
Wheat	:	4,123	: 148,556	: 36.	:	3,396	: 69,725 : 20.5
Rye	:	12,995	: 398,868	: 30.7:	:	10,236	: 209,519 : 20.5
Barley (Summer)	:	3,413	: 139,635	: 40.9:	:	2,846	: 73,013 : 25.7
Oats	:	9,698	: 593,769	: 61.2:	:	7,912	: 284,567 : 36.0
Potatoes	:	6,924	: 1,617,396	: 233.6:	:	6,725	: 1,494,181 : 222.2
Meadow Hay (tons)	:	13,023	: 28,499	: 2.2:	:	13,496	: 21,209 : 1.57
Clover (tons)	:	4,230	: 10,618	: 2.5:	:	4,677	: 7,746 : 1.66

(1) It is generally believed that 1913 crop was overestimated possibly 10%, and that the 1922 crop was underestimated because of Government requisition of grain, but there has been no statement as to the amount underestimated.

(a) Present boundaries.

Table 8						
Percentage Decrease in Actual Production						
1922 as compared to 1912 - 1913.						
I t e m	:	%	::	I t e m	:	%
Wheat	:	53.1	::	Potatoes	:	7.6
Rye	:	47.5	::	Meadow Hay	:	25.6
Barley (Summer)	:	47.7	::	Clover	:	27.0
Oats	:	52.1	::	All area (cultivated)	:	4.3
Decrease in number of cows						14.1

It will be observed that according to these figures the German production of fodder grain fell off greatly along with other grain crops, the two chief fodder grains noted by the statisticians being oats and summer barley. The three years 1912, 1913 and 1914 show an average total production of 13,802,833 tons of these two grains, while the three year average for 1920-21-22 was only 7,049,604 tons. Both figures are for the present German area.

The advisability of accepting the above data with reservations is indicated by a brief analysis of the situation in 1922.

Government control of the grain trade gave farmers every incentive to understate acreages under cultivation and yields of crops, as well as to feed surplus grain to livestock. That such practices took place is borne out by observations of numerous persons in positions of authority, as well as by the general improvement in the condition of cattle coming to market during the past year.

Government control has now been lifted, and may result in diverting more feed to market, but the 1923 harvests are so large that the amount available for feed on the farm will still be large. Production in 1923 was as follows:-

Table 9

Principal Crops - Production in 1923 as compared to 1922.						
C R O P	:	1922	:	1923	:	Per Cent
	:	1,000 Bushels	:	1,000 Bushels	:	I n c r e a s e
	:	or Tons	:	or Tons	:	
	:		:		:	
Wheat	:	69,725	:	103,604	:	48.6
Rye	:	209,519	:	282,452	:	34.8
Barley (Summer)	:	73,013	:	99,162	:	35.8
Oats	:	284,567	:	411,676	:	44.7
Potatoes	:	1,494,181	:	1,200,000	:	- 19.7

Feed was an important item in pre-war imports and the whole German livestock industry was heavily dependent upon imports of concentrates. Since the war, imported supplies have been greatly reduced.

Table 10

Net Imports of Concentrates (1,000 Tons)						
	:	Y e a r	:	First Six Months		
	:	1912-13	:	1922	:	1923
Barley	:	3,425	:	294	:	93
Oats	:	168	:	94	:	10
Maize	:	1,031	:	1,196	:	688
Bran	:	1,612	:	133	:	49
Rice Offals	:	211	:	76	:	36

In 1922 a large proportion of the maize imports were used for alcohol production, but as the resulting mash (schlempe) was used for cattle feed, there is little difference in the comparison. Competent authorities stat

that this remaining mash is nearly equal as a cattle feed to the original maize.

Table II

COMPARISON OF OIL CAKE AVAILABLE FROM IMPORTS
(1,000 tons)

	Year		First Six Months	
	1912-13	1922	1922	1923
Net Import	567	-80	-52	-98
Approximate German Manufacture from Imported materials	1,102	482	262	244
	1,669	402	210	146

Total imports of oil cake and grain, it appears, amounted to 8,114,009 tons in the years 1912 and 1913, but only to 2,194,000 tons in 1922, or about 27% of the pre-war supplies. This fact probably accounts to a considerable extent for the low milk production previously mentioned, since authorities on feeding and dairy problems estimate that about 40% of Germany's pre-war milk, cheese and butter production was dependent upon the use of foreign concentrates.

First hand investigation on a great number of German farms in the last few months of 1922 and early in 1923 revealed that farmers were rarely feeding milk cows any concentrates. Their use is not likely to increase to any extent as long as German importing power remains so low. 1923 harvests, moreover, diminish the need for imported concentrates and are probably ample to care for increased numbers of dairy animals, the tendency toward which has been noted.

Everything considered, production factors are favorable for increased supplies of milk and dairy products.

-- Factors Affecting Demand --

Low post-war consumption of butter seems to have been due as much to lack of supplies as to low purchasing power of the German people. It has been out of the question to import butter in any quantity, while domestic production could not have been much greater than it was under the favorable circumstances that have existed in the dairy business during recent years. The result has been a resort to increased use of margarine. The purchasing power of the German people, particularly in the cities, will continue to be low for some time to come. There is no question however, about their preference for butter over substitute products.

FAT FROM SLAUGHTERED CATTLE.Production and Supplies, 1913-1922.

The German Government has estimated that 187,390 tons of fat was produced annually in 1912 and 1913 from cattle. This production includes not only the fat for oleo and tallow commonly obtained in slaughtering but also the fat contained in the carcasses and available by rendering. The importations in 1913 of beef and veal, fresh and plainly prepared, were 35,562 tons, the fat content of which must be added to the above figure.

Making into account decreased slaughtering weights in 1922 but assuming that dead carcasses yielded as much fat per cwt. as they did in 1912-13, it is estimated that beef fat production during the past year may have been about 126,765 tons.

The Government does not indicate the exact figures for slaughtering which were used in determining the amount of beef fat produced, but, from such data as it has given it is apparent that fat yield was placed at about 18 or 19 per cent of the dressed weights.

It is obvious, however, that the fat yield from the relatively light cattle of 1922 would be lower than that from the heavier stock of pre-war days, as will be noted from the following table. Consequently, without questioning the indications as made, it seems safe to say that actual beef fat production in 1922 was considerably less than 126,765 tons. However, there is no exact figure available.

Table 12.

Cattle: Slaughtered under Inspection in Germany.

Former Territory	Steers	Bulls	Cows	Young cattle: over 3 mos.	Calves under 3 mos.
1912	524,235	423,086	1,731,996	961,391	4,366,302
1913	518,244	498,138	1,633,561	879,032	4,083,445
Present Territory					
1922	316,357	323,534	1,422,478	965,767	3,207,789
Slaughtered Weights (lbs)					
1912-13	727.5	683.4	529.1	407.9	38
1922	674.6	579.8	460.8	354.9	36

It should be remembered that the fat figure above does not all represent production, since a great deal of slaughtering in 1922 was done at the expense of cattle stocks. During the first six months of the year the number of cattle slaughtered under inspection was 27% greater than for the same period in 1921, (See table No. 13) and as a result the Census shows a reduction from 16,790,699 head on December 1, 1921, to 16,309,474 on December 1, 1922. This reduction was relatively largest among young cattle.

Fat from slaughtering of cattle in 1922 shows a great increase over the years immediately after the war. Taking into consideration the number of animals slaughtered and the average weights, the following is the situation as regards dressed weights: considering 1922 as 100%, 1919 would have been about 62%; 1920, 50%; 1921, 90%; and the fat yields in the leaner years probably would have been lower in proportion to the dressed weight than they were in 1922.

As before noted, the importations of beef and veal, fresh and plainly prepared, were 35,562 tons in 1913, while in 1922 they were 31,405 tons. The smallness of the difference is somewhat surprising in view of Germany's low buying power during 1922, and must be attributed to the shortage of supplies of domestic meat.

- Factors Affecting Production -

Beef and veal production in Germany are largely by-products of dairying, as is to be noted at once from the preponderance of veal calves and cows among cattle slaughtered. Both depend largely, therefore, upon conditions in the dairy business.

Beef and beef fat production increased in 1922 at a more rapid rate than natural improvement in the dairy business warranted. This was probably chiefly due to the poor forage crop of 1921.

During the first three months of 1923 a reaction became apparent. Slaughtering at the 36 most important markets dropped off 25% compared to the same period last year, and have been light ever since. Market prices for live cattle have risen to near world levels, because of the resultant scarcity of supplies, but this fact appears to have had little effect on inspected slaughtering.

This decreased slaughter seems to be partially due to the favorable outlook for the dairy industry, which has already been dwelt upon, and indicates that farmers may be turning their attention more to the upbuilding of their herds. But it is also true, that farmers have been resorting more and more to home slaughter, distributing their products direct to consumers and merchants in exchange for their own needs or for money of a more tangible value than paper marks.

It is probable that supplies of beef fats will not increase to any extent in the near future, at any rate, not more rapidly than the recovery of the dairy industry will permit. With a continuation of the present apparent emphasis on increasing herds, there may even be something of a decrease in beef fat production.

Table 13

ANIMALS SLAUGHTERED UNDER INSPECTION IN GERMANY.

	Year.	Steers.	Bulls.	Cows.	Young cattle over 3 months.	Calves under three months.
Former Territory of 1913	1912	524,236	423,086	1,731,996	961,391	4,366,302
	1913	518,244	498,138	1,633,561	879,032	4,088,445
Territory of 1921	1913	494,352	471,156	1,491,829	804,192	3,737,957
	1919	629,232		909,655	994,709	892,456
	1920	532,022		895,606	661,855	1,223,735
	1921	366,169	369,992	1,305,539	875,852	3,126,971
Present territory excluding Saar section:.....	1913	492,148	466,091	1,463,656	791,452	3,702,536
	1921	359,483	364,635	1,283,536	866,466	3,103,376
	1922	316,357	323,534	1,442,478	965,767	3,207,789
Slaughtering under Inspection during the first 6 months.	1921	127,776	151,883	557,565	314,373	1,449,129
	1922	147,131	158,831	724,157	435,490	1,890,369
Slaughtered weights in pounds <u>a</u>	1908	728	683	529	403	85
	1920		342			68
	1921-22	675	580	461	385	86

a Slaughtered (or dressed) weights of animals are important in making comparisons. The German Meat Office has found average slaughtered weights for 1920 as above, and for a general comparison the same weights can be applied to 1919, although average weights were undoubtedly less for that year.

TABLE 14.

ANIMALS SLAUGHTERED UNDER INSPECTION IN GERMANY, CONT'D.

	: Year :	: Hogs :	: Sheep :	: Goats :	: Horses & : : one hoof: Dogs.	: animals.:
Former Territory of 1913	: 1912 :	: 18,217,356 :	: 2,269,419 :	: 474,534 :	: 179,113 :	: 8,094
	: 1913 :	: 17,872,028 :	: 2,092,989 :	: 469,798 :	: 163,232 :	: 7,356
Territory of 1921	: 1913 :	: 16,587,896 :	: 1,968,434 :	: 422,856 :	: 153,564 :	: 7,346
	: 1919 :	: 1,367,927 :				
	: 1920 :	: 3,011,567 :				
	: 1921 :	: 6,926,602 :	: 2,093,762 :	: 320,155 :	: 149,695 :	: 5,482
Present Territory excluding Saar section	: 1913 :	: 16,375,542 :	: 1,966,893 :	: 419,973 :	: 153,039 :	: 7,344
	: 1921 :	: 6,824,761 :	: 2,092,358 :	: 315,387 :	: 148,679 :	: 5,482
	: 1922 :	: 6,916,735 :	: 1,769,406 :	: 259,551 :	: 240,014 :	: 13,595
Slaughtering under Inspection during the first 6 months	: 1921 :	: 2,966,666 :	: 576,466 :	: 142,535 :	: 53,192 :	
	: 1922 :	: 3,956,993 :	: 731,871 :	: 155,484 :	: 94,676 :	
Slaughtered ^a . weights in pounds.	: 1908 :	: 187 :	: 48 :	: 35 :	: 518 :	
	: 1920 :	: 165 :	: 37 :	: 35 :	: 518 :	
	: 1921-22 :	: 183 :	: 48 :	: 35 :	: 525 :	

^a The German Health Office, on October 18, 1922, issued a bulletin giving the average slaughtered weights of animals for 1921 and 1922 on the basis of weights during the year from April 1, 1921, to March 31, 1922. The slaughtered weights for 1908 can be taken as representative of pre-war years.

FATS FROM HOGS AND PORK PRODUCTS.

Production and Supplies.

Domestic Production - Hogs.

For all practical purposes present domestic production of pork fats in Germany may be considered synonymous with hog slaughter. Almost no pork fat is sold as a distinct commodity. Total supplies of fat available from swine in 1912-13, according to the German Department of Agriculture, amounted to 595,242 tons of which it is estimated 187,000-198,000 tons were rendered into lard. The balance consisted of fat sold with fresh pork or in the form of bacon.

The German Department of Agriculture indicates that with a fat yield per cwt. of dressed carcasses in 1922 equal to that of 1913, the fat from German killed pigs would have dropped from 595,242 tons in 1912-13 to 264,552 tons in 1922. The following tabulation shows the 1913-1922 figures with respect to slaughtering and the number of hogs which form the basis of the above estimate. It is apparent that 1922 farm killings were large.

Table 15
Hogs, Number and Slaughtering
1913 and 1922

Total Number of Hogs December 1	: Number : Slaughtered : under Inspec- : tion Follow- : ing year.	:	Total Number of Hogs December 1	:	Per cent : of Basic : Supply : Killed	:	Per cent : change in : Basic Supply : During Year.
1912 - 21,923,707	: 17,872,028	:	1913 - 25,659,140	:	81.5	:	17.0
1921 - 15,817,817	: 6,916,735	:	1922 - 14,682,622	:	43.7	:	- 7.2
:	:	:	:	:	:	:	:

The figures for fat given above indicate a supply in 1922 of about 44% of pre-war, and presumably have been arrived at after making allowance for decreased population, as on that basis they agree substantially with figures for hog slaughtering compiled by the United States Department of Agriculture from authentic sources. As a matter of fact, however, the fat yield was probably slightly less than the 265,000 tons indicated above because pigs were marketed somewhat heavier and more mature, both facts tending to lower fat yield.

The average weight of the dressed carcasses for 1922, however, was not greatly below that of pre-war years, that is, 183 pounds dressed against 187.4 pounds. Taking into consideration the reduced population and the decreased average dressed weight, the total fat supply from hog slaughtering under inspection in 1922 was about 42.4% of that in 1912 and 1913.

Although fat available from hogs was very low in 1922, it represented a marked improvement over the years just after the war. The slaughtering of pigs under inspection during the last four years was as follows:-

Table 16.

PIGS SLAUGHTERED UNDER INSPECTION				
	:		:	
1919	:	1,367,927	:	German territory in 1921.
1920	:	3,011,567	:	" " " "
1921	:	6,824,761	:	Present German territory.
1922	:	6,916,735	:	" " "
	:		:	

Average dressed weight per carcass in 1919 and 1920 was about 165-1/2 pounds against 183 pounds in 1922. Taking the dressed pork yield in 1922 as 100%, the total dressed pork yield in 1919 would have been 16.7%, in 1920, 39.4%, and in 1921 about 98%.

As previously mentioned comparison on the basis of German rendered lard is useless at present, because only a very small proportion is rendered. While about 30% was rendered before the war, in 1922 nearly all the fat was sold with the fresh pork or in the form of bacon. Practically none was used for margarine. German hog lard is a little higher in price than the American, but supplies on the market are so small as to offer very little competition.

Pigs killed in Germany were never entirely from domestic resources. The imports of live pigs for slaughtering were included in 1913 and 1922 figures, amounting in 1913 to 147,300 head, 145,800 of which came from Russia. In 1922 the imports were 79,813 head, chiefly from Servia, and from the Baltic States via Memel. Imports during the first half of 1922 and 1923, were 60,078 and 19,009 respectively.

Factors affecting Production.

Aside from the demand for such products, numbers of hogs and feed supplies are the most important factors affecting production of pork fats.

At the close of 1922, prospects did not seem especially favorable for increased numbers of hogs in Germany during 1923. The national herd had decreased over 7% during the year and the domestic feed situation was not particularly bright. Feeding authorities, moreover, estimated that between 20 and 25% of the pre-war German pig production depended upon imports of foreign concentrates, largely barley, of which, three million tons had been secured from Russia in pre-war years. 1922 imports of these products as we have seen have fallen very low. The potato crop, however, had been exceptionally large.

During the first half of 1923 pork production prospects changed. Slaughtering during the first quarter decreased 33% compared with the previous year, and the Prussian Hog census for June, which may fairly be taken as representative of all Germany, shows that there has been a large increase in the number of swine. Spring pigs are 25% more numerous than a year ago, and brood sows have increased 16%. All pigs are about 10% more numerous than last year. Census figures follow:-

Table 17

Prussian Hog Census*				
<u>Item</u>	:	<u>June 1, 1923</u>	:	<u>June 1, 1922</u>
Pig holding householder	:	2,319,549	:	2,756,770
Farrows of less than 8 weeks	:	2,244,545	:	1,804,947
Young pigs of less than 6 months	:	4,638,165	:	4,514,676
Boars of less than one year	:	31,045	:	26,793
Brood sows of less than 1 year	:	418,937	:	339,989
All other pigs of less than 1 year	:	1,133,093	:	1,276,396
Boars of one year and more	:	28,020	:	26,761
Brood sows of one year and older	:	525,013	:	560,383
All pigs of one year and older	:	<u>141,902</u>	:	<u>133,991</u>
	:	<u>9,460,720</u>	:	<u>8,683,936</u>
	:		:	

*Owing to the occupation of the Ruhr District, the totals given are probably less than the actual number of hogs because of the difficulties experienced in securing figures.

The domestic feed factor, as previously shown, is now more favorable than at any time since before the war on the strength of 1923 crops. For a time, during the stabilization of the mark in the spring of the present year, it was also profitable to import concentrates for feeding purposes, and it is likely to again become profitable, now that the mark has about run its course.

All in all, the situation is favorable for substantial increases in domestic production and supplies of hogs and pork products.

Imported Supplies.Bacon and Fresh Pork.

A substantial amount of German pork fat supplies is in the form of imported bacon and fresh pork. Net imports of these commodities in 1912-13 and 1922 were as follows:- (fresh pork carcasses are taken as yielding 40% fat, and bacon, which consists primarily of fat backs and other fat cuts, has been figured at an 80% yield).

Table 13

Net Imports of Fat-containing Pork Cuts					
Fresh Pork			Bacon		
:	Gross Wt.	:	Gross Wt.	:	Fat yield
:	- Tons -	:	- Tons -	:	
1912-13	16,143	:	1,933	:	1,543
1922	6,890	:	28,340	:	22,670
:	:	:	:	:	:

In 1912-13 about 50% of the fresh pork came from Holland, while the next largest source was Russia. American shipments were so small that they were not listed. In 1922, however, the United States supplied more than one-half, or 4,080 tons, while Holland supplied about 440 tons.

A bright spot in the American fat trade is the sale of bacon to Germany. Pre-war Germany was nearly self-supplying in regard to bacon production. Meat from barley-fed swine was much preferred, and although it ranged about 6% more expensive than maize, that grain was largely used for pig feeding. Necessity has overcome preference, however, and practically all the increased bacon imports shown above for 1922 came from the United States, probably because of the high fat-content of American bacon. The largest imports have occurred at times of lowest home production.

- L A R D -

Pre-War Situation.

Germany has been for many years, excluding the war period, one of the United States' most important foreign outlets for lard. The imports of lard

into Germany, furthermore, have been almost entirely of American origin. This situation has arisen largely because of American methods of producing pigs and American methods of marketing and packing pork, all of which have combined to give the United States large quantities of lard for export, while other important pig raising countries have practically no exportable surplus. Furthermore, under American methods of refining lard keeps in good condition for months, while the lard from smaller producing countries does not have such good-keeping qualities. Consequently, the lard trade is essentially American trade.

Total German imports for the years 1912-13 were 117,675 tons of which 94.3% or 111,100 tons, came from the United States.

Post-War Situation.

With the enormous post-war reduction in German pork fat production and the shortage in other fat supplies, an opportunity was given for increased sales of American lard, and for the years 1920 and 1921 there was a substantial growth in this trade over pre-war figures. The following tabulation shows total imports for the years mentioned, and the share received from the United States.

Table 19.
German Lard Imports.
(Tons of 2,000 lbs.)

	:	1912-13	:	1920	:	1921	:	1922	:	(6 mos.) ^(a) 1923
Total	:	117,675	:	136,038	:	161,162	:	72,000	:	70,729
From U.S.	:	111,100	:	125,790	:		:	63,153	:	62,500

(a) Wirtschaft und Statistik.

Imports in 1922, in dropping to 72,000 tons, decreased 55% in one year. These total figures for imports in 1922 may appear to be in contra-

diction to the statistics of shipments from America to Germany, but American figures, naturally could not show re-exports from Germany, and from indications received from some of the American packers' agents in Germany, it appears that perhaps 50% of the lard receipts in Hamburg in 1922 were forwarded on to Austria, Czecho-Slovakia, Hungary, Holland, Poland, and other countries.

Causes of Decreased Lard Imports in 1922.

So far as Germany is concerned, the chief reasons for this great drop in American lard trade were as follows:

(1) Slightly increased slaughtering in 1922 over 1921, with the increase crowded largely into the first half of the year, a fact probably influencing importations. A reaction towards holding pigs on the farms, however, came in the summer of 1922. For other animals the increased slaughtering in 1922 over 1921 was somewhat more important.

(2) Changes in the general economic situation incident to the fall of the mark, made it increasingly difficult to purchase supplies abroad.

(3) The competition of other fats with lard, particularly vegetable fats and margarine. This, without doubt, was one of the most important factors explaining the decrease in lard purchases. At least, the sales of these products represented a strength of competition, that does not seem to be fully realized.

Exports of lard to Germany from the United States mounted up early in 1923 during the months of mark stabilization, to the highest point since the war, at a time when the seasonal trend is usually downward. On the resumption of currency depreciation, however, a rapid decline set in. Monthly figures for the first ten months of 1921, 1922 and 1923 are as follows:-

Table 20

United States Exports of Lard to Germany
By Months

Month	1921	1922	1923.	Average Exchange
	<u>Tons</u>	<u>Tons</u>	<u>Tons</u>	<u>Marks per Dollar</u>
January	9,230	9,458	18,561	13,700
February	15,210	15,094	16,341	26,316
March	11,893	12,570	22,416	21,277
April	5,041	3,384	14,757	24,390
May	5,923	4,138	23,396	45,455
June	15,029	9,096	9,945	100,000
July	13,256	10,514	11,785	2,940,000
August	21,651	11,486	15,966	2,950,000
September	26,927	8,269	18,695	---
October	7,636	11,597	11,848	---

German figures show imports of 44,221 tons of lard during the first six months of 1922 and 70,729 tons during the corresponding period of 1923.

Factors Affecting Demand for Pork and Pork Products.

There are three important factors that will in the future affect German demand for American pork and pork products, namely, (1) German production of those products, (2) competition of cheaper fats, and (3) the reduced external buying power of Germany.

American post-war pork exports appear to have been of a temporary nature, taking the place of home production. It has been shown that prospects are favorable for substantially increased German production of hogs. This increase will probably be reflected very largely in fresh pork. America was not a source of imports of pork in 1912-13, and with no prospect of increased importing power in Germany in the near future, our post-war exports of pork to Germany are very likely to disappear, or at least be seriously curtailed. German bacon imports will also probably be curtailed, though to a less extent than the fresh pork trade. Post-war bacon imports

have consisted largely of fat American bacon, bought chiefly because of its fat content.

Lard imports will also probably be somewhat decreased because of increased home production, but Germany was one of our largest customers before the war, and may be expected to consume large quantities in the future.

The most important factor affecting the demand for lard is the competition of cheaper fats. It has both immediate and future significance because vegetable fats are inherently cheaper than animal fats. Other things being equal, however, consumers have a preference for lard. The German fat trade in general, and, manufacturers of competing products in particular, on the other hand, are apparently doing everything possible to overcome this preference. They are well organized, seem to be well supplied, and are doing a much larger business than before the war.

There are many uses for which vegetable oil compounds are not suitable or are as yet not entirely satisfactory, but on the whole they are proving very successful, and seem destined to find wider, and increased use, to a considerable extent at the expense of lard.

The factor of reduced buying power emphasizes the two factors first mentioned. It gives added incentive to German production and to increased use of the most economical fats.

- VEGETABLE OILS -

The use of vegetable oils in prewar Germany had reached the point where this type of fat constituted about 28.6% of the total German fat supplies, and although chiefly of foreign origin it had given rise to an important domestic industry in the crushing of oil-containing seeds and kernels.

There are no reliable estimates or statistics on the quantity of vegetable oils produced in Germany either before or since the war, and it has been necessary to determine, both the prewar and post-war situation of the industry by computation. Available statistics of imports and exports of oil fruits and seeds give a reliable basis for initial computation, and consultation with leading men in the oil and oil crushing industry has supplied the general and technical information on the average practical yield of various fruits and seeds necessary for determining oil production.

Pre-war as Compared to Post-war Production.

By this method the average supplies of oil available for German consumption were found to have amounted, in 1912-13, to 602,767 tons, a figure about 1-1/2% greater than the 595,000 tons given in the generalized indications of the German Government. In the same way production for 1922, together with exports and imports of oils, was found to be 558,093 tons. This figure has been indicated roughly as 550,000 tons in the Comparative Fat Table. (For details see Table No. 26.) The following tabulation shows the trend of the oil trade in 1922 as compared to pre-war years:

Table 21

German Oil Trade. 1912, 1913, - 1922.
(Tons of 2,000 pounds)

Year	Oil Imports	Oil Exports	Import Surplus	Export Surplus	Oil from Seeds	Total Available for Consumption
1912	106,740	126,200		19,460	582,823	563,363
1913	38,165	147,303		59,138	701,309	642,171
1912/13 ave.	97,453	136,752		39,299	642,066	602,767
1922	166,854	18,995	147,859		410,234	558,093

In 1912/13, it will be observed, Germany had an average export oil balance of 39,299 tons, that is, Germany was crushing oil for export, while in 1922 there was an import balance of 147,859 tons, imports of oil in 1922 having increased 71% over the pre-war figure.

The average of the oil produced from crushing imported seeds was 642,066 tons in 1912/13, while in 1922 it had decreased to 410,234 tons - about 46% of the 1912/13 production. The total weight of oil seeds crushed in 1922 was only slightly over 50% of the 1912/13 figure, but because of changes in the varieties of fruits crushed, the average oil yield was raised from about 37% in 1912/13 to 46% in 1922, a fact explaining the relatively large production of oil (seed weight considered) mentioned above.

According to these calculations comparative per capita supplies of oils from imports stood as follows:

in 1912/13 602,767 tons for 68 million people - or 17.73 lbs. per capita
in 1922 558,093 tons for 60 million people - or 18.60 lbs. " "

There are also some supplies of oil from home grown seeds which are

estimated by the Government to have amounted to 33,000 tons in 1912/13 and to 44,000 tons in 1922.^a Adding this to the above, we have a total oil consumption per capita of 18.70 lbs. in 1912/13 and 20.07 lbs per capita in 1922.

Furthermore, proportionally less oils were used for industrial purposes in 1922 than in the years 1912/13. Consequently, vegetable oils available for human consumption in 1922 would be increased still more than the above figures indicate.

The oil supplies, which have been indicated for 1922, moreover show a great improvement over the years just after the war. It is impossible to give a detailed comparison as has been done for 1922, because of breaks in available statistics on exports for some of the months of 1921, but the following table of imports of the important seeds is a good criterion.

Table 22

Imports of the Most Important Oil Seeds into Germany:
(Tons of 2,000 lbs.)

	:	:	:	:	:			
	:	1913	:	1920	:	1921	:	1922
Rape and rape-seed	:	169,122	:	9,776	:	44,887	:	135,979
Peanuts	:	108,119	:	1,097	:	29,313	:	76,381
Sesam	:	127,909	:	2,755	:	38,671	:	17,281
Linseed and linmeal	:	617,645	:	5,849	:	35,367	:	113,708
Cottonseed	:	242,282	:	58	:	569	:	21,399
Soybeans and	:		:		:		:	95,246
Movra seeds, etc.	:	138,614	:	2,509	:	12,697	:	8,934
Palm Kernel	:	260,051	:	3,002	:	19,977	:	139,860
Copra	:	216,546	:	10,680	:	78,110	:	311,595
Total	:	1,880,288	:	35,726	:	259,591	:	920,383

^a The President of the Oil Crushers Association recently made a rough estimate of 55,000 tons production for 1922.

Post-War Tendencies.

It has been widely hoped in Germany to so increase the culture of home grown oil seeds as to affect decidedly the dependence of the nation on importations of foreign oil fruits and seeds. During the war period such seeds were greatly increased. Since the war, however, these gains have been gradually melting away. Statistics of comparative acreages show that back in 1873 the crop area for the most important home grown seeds, viz. rape and rape-seed, hemp and flax was very large, and that it tended to decrease up until the temporary recovery of the war period.

Table 23

Crop Area of German Oil Seeds, -- Acres.		
1873	-	826,550
1913	-	134,670
1920	-	363,880
1921	-	328,082
1922	-	219,030

The change in the varieties of fruits crushed, previously mentioned, is important, in that it shows a tendency to select the varieties best suited for edible purposes and particularly those best suited to replace animal fats. The large quantities of linseed crushed before the war, not so serviceable for edible purposes, have dropped to about one-fourth their former volume. The use of cottonseed, which gives a high grade of edible oil, has fallen off greatly, as it is comparatively expensive considering the yield and has been particularly high since the war. Copra, one of the best suited of all for food purposes, shows a big increase, and the cocoanut oil produced made up nearly 1/2 of the 1922 production. This indicates pointedly the general trend in the use of vegetable oil.

It is not within the scope of this report to do more than generalize as to the uses of vegetable oils, yet generalization is difficult. Most oils, however, can be used either for industrial or edible purposes, such use depending upon market conditions or upon the condition of seeds on their arrival in Germany, as oil seeds which commonly are used for edible purposes, are often found on arrival to be unsatisfactory for that purpose, but are still suitable for other use. Harvesting conditions in the country of origin also affect the suitability for human consumption. Further modifications in use depend somewhat upon the refinement of the oil. Linseed oil is the only important vegetable oil imported into Germany in large quantities, that is not essentially an edible oil.

The use of vegetable oil as food has been shown to be on the increase, and its utilization in its most important edible form, margarine, will be discussed in subsequent pages.

The Crushing Industry.

Imported seeds and kernels which comprise the great bulk of raw material for oil crushing are processed largely at about 120 medium and large sized mills located chiefly about Hamburg, Harburg and Bremen, although there are a few in the southern part of Western Germany. The mills of first class importance are less than a hundred in number. There are also said (a) to be about 10,000 very small mills scattered about Germany, which depend largely upon domestic seeds.

(a) President of Oil Crusher Association.

Table 24.

GERMANY: FOREIGN TRADE IN VEGETABLE OILS AND OIL SEEDS AND
CONSUMPTION OF VEGETABLE OILS, 1912.

(Tons of 2,000 lbs.)

I t e m.	O i l s			S e e d s			Total	
	Import	Export	(1) Balance	Import	Export	Balance	Oil Yield	Consump- tion
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Rape and Rapeseed	772:	2,495:	-1,723:	138,541:	7,823:	130,718:	47,058:	45,335
Marsh-marigold	:	:	:	2,955:	42:	2,913:	728:	728
Mustard	:	:	:	7,947:	300:	7,647:	2,447:	2,447
Poppy & sunflower seeds	6,463:	462:	6,001:	18,081:	:	18,031:	6,328:	12,329
Madia & Kapok seeds	:	:	:	343:	:	343:	103:	103
Peanuts	1,153:	12,870:	-11,717:	77,017:	:	77,017:	34,658:	22,941
Sesame	616:	:	616:	109,438:	145:	109,293:	51,368:	51,984
Linseed	2,963:	1,069:	1,894:	363,861:	5,951:	357,910:	118,110:	120,004
Hempseed	:	:	:	8,069:	3,496:	4,573:	1,509:	1,509
Cottonseed	29,624:	:	29,624:	235,999:	1,986:	234,013:	42,122:	71,746
Soya beans & movra: seed	12,211:	1,244:	10,967:	138,036:	:	138,036:	19,325:	30,292
Palm kernel	6:	35,643:	-35,642:	288,150:	:	288,150:	138,312:	102,670
Copra	:	:	:	202,006:	1,081:	200,925:	120,555:	120,555
Kula nuts	:	:	:	668:	:	668:	200:	200
Tree oil	3,950:	230:	3,720:	:	:	:	:	3,720
Lavat oil	5,336:	:	5,336:	:	:	:	:	5,336
Wood oil	6,303:	:	6,303:	:	:	:	:	6,303
Castor oil	9,463:	:	9,463:	:	:	:	:	9,463
Cocoa butter	68:	4,015:	-3,947:	:	:	:	:	-3,947
Muskat butter	22:	2:	20:	:	:	:	:	20
Cotton stearine	204:	:	204:	:	:	:	:	204
Palm oil	13,088:	85:	13,003:	:	:	:	:	13,003
Cocoanut oil	367:	20,197:	-19,830:	:	:	:	:	-19,830
Movra oil and vege- table tallow	1,235:	6:	1,229:	:	:	:	:	1,229
Oil acid	12,648:	1,202:	11,446:	:	:	:	:	11,446
Vegetable tallow	56:	46,675:	-46,619:	:	:	:	:	-46,619
Kunstspersfett	192:	:	192:	:	:	:	:	192
Total	106,740:	126,200:	-19,460:	1,591,111:	20,824:	1,570,287:	582,823:	563,363

Note:- In addition to the above quantities 22 tons of margarine were imported and 542 tons exported in 1912.

/1 Minus sign indicates excess of exports over imports, made possible by domestic production of oil from seeds..

Table 25.

GERMANY: FOREIGN TRADE IN VEGETABLE OILS AND OIL SEEDS AND
CONSUMPTION OF VEGETABLE OILS, 1913.
(Tons of 2,000 lbs.)

Item.	O i l s			S e e d s			Total	
	Import	Export	^{/1} Balance	Import	Export	Balance	Oil Yield	Consumption
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Rape and Rapeseed	1,295	4,563	-3,268	169,122	5,482	163,640	58,910	55,642
Marsh-marigold				2,754	5	2,749	687	687
Mustard				8,648	289	8,359	2,675	2,675
Poppy & Sunflower seeds	4,234	522	3,712	22,692		22,692	7,942	11,654
Madia seeds etc.				502		502	151	151
Peanuts	567	17,862	-17,295	108,119		108,119	48,654	31,359
Sesame	762		762	127,909		127,755	60,045	60,807
Linseed	3,489	633	2,856	617,644	4,665	612,979	202,283	205,139
Hempseed				10,860	2,732	8,128	2,682	2,682
Cottonseed	17,943		17,943	242,282	892	241,390	43,450	61,393
Soya beans & Movra seeds	3,461	1,077	2,384	138,614		138,614	19,406	21,790
Palm kernels	53	31,916	-31,863	260,051		260,051	124,824	92,961
Copra				215,546	605	215,941	129,565	129,565
Kula nuts etc.				118		118	35	35
Olive oil	2,519	165	2,354					2,354
Lavat oil	2,737		2,737					2,737
Wood oil	5,255		5,255					5,255
Castor oil	10,501		10,501					10,501
Muskat butter	16	2	14					14
Cotton stearine	457	6	451					451
Cocoa butter	104	2,160	-2,056					-2,056
Palm oil, non-edible	16,614	44	16,570					16,570
Coccanut oil	655	27,423	-26,768					-26,768
Movra oil etc. including vegt. tallow	3,799	121	3,678					3,678
Olein	13,371	2,253	11,118					11,118
Edible vegetable	88	58,556	-58,468					-58,468
Kunstspeisefett	245		245					245
Total	88,165	147,303	-59,138	1,925,861	14,824	1,911,037	701,309	642,171

Note:- In addition to the above quantities 21 tons of margarine were imported and 200 tons exported in 1913.

^{/1} Minus sign indicates excess of exports over imports, made possible by domestic production of oil from seeds.

Table 26

GERMANY: FOREIGN TRADE IN VEGETABLE OILS AND OIL SEEDS AND
CONSUMPTION OF VEGETABLE OILS, 1922.
(Tons of 2,000 lbs.)

I t e m.	O i l s			S e e d s			: Total	
	Import	Export	^{/1} Balance	Import	Export	Balance	Oil Yield	Consump- tion.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
Rape and Rapeseed	1,540:	765:	775:	135,979	249:	135,730	51,577:	52,352
Marsh-marigold	:	:	:	15	4:	11	3:	3
Mustard	:	:	:	2,998	21:	2,977	953:	953
Poppy	:	:	:	539	:	539	221:	221
Sunflower seed	2,004:	213:	1,791:	493	:	493	168:	1,959
Madia seeds etc.	:	:	:	586	:	586	176:	176
Peanuts	2,980:	2,672:	308:	76,381	1,036:	75,345	33,905:	34,213
Sesame	211:	:	211:	17,281	:	17,281	8,122:	8,333
Linseed	32,229:	1,697:	30,532:	113,708	52:	113,656	37,506:	68,038
Hempseed	:	:	:	814	7:	807	266:	266
Cottonseed	2,935:	:	2,935:	21,399	:	21,399	3,852:	6,787
Soya bean	45,718:	562:	45,156:	95,246	:	95,246	13,334:	58,490
Movra seeds	1,373:	:	1,373:	8,934	:	8,934	2,680:	4,053
Palm kernel	4,038:	2,684:	1,354:	139,860	4:	139,856	67,131:	68,485
Copra	:	:	:	311,595	:	311,595	186,957:	186,957
Kula nuts etc.	:	:	:	11,277	:	11,277	3,383:	3,383
Olive oil	385:	2:	383:	:	:	:	:	383
Lavat oil	1,355:	:	1,355:	:	:	:	:	1,355
Wood oil	3,518:	:	3,518:	:	:	:	:	3,518
Castor oil	3,868:	:	3,868:	:	:	:	:	3,868
Muskat butter	9:	1:	8:	:	:	:	:	8
Cotton stearine	49:	:	49:	:	:	:	:	49
Cocoa butter	:	8,136:	-8,136:	:	:	:	:	-8,136
Palm oil, non-edible	5,627:	:	5,627:	:	:	:	:	5,627
Cocoanut oil	32,162:	836:	31,326:	:	:	:	:	31,326
Olein	2,162:	878:	1,284:	:	:	:	:	1,284
Edible vegetable	:	:	:	:	:	:	:	:
tallow	9,176:	549:	8,627:	:	:	:	:	8,627
Kunstspeisefett	15,515:	:	15,515:	:	:	:	:	15,515
Total	166,854:	18,995:	147,859:	937,105	1,373:	935,732	410,234:	558,093

Note:- In addition to the above quantities 402 tons of margarine were imported and 4753 tons exported in 1922.

^{/1} Minus sign indicates excess of exports over imports, made possible by domestic production of oil from seeds.

M A R G A R I N E.

More fat is used by German consumers in the form of margarine than in any other way. The margarine industry is responsible for the importation and use of the large quantities of vegetable oils previously noted, and the trend and development of that industry affect and explain perhaps more than any other single factor the status of American sales in Germany of oleo oil, stearine, cottonseed oil and other vegetable oils and, to some extent, lard.

- PRODUCTION -

Pre-War in Comparison to Post-War.

There are no exact statistics relative to the production of margarine. A considerable number of people familiar with the industry, however, have estimated the 1913 production at between 225,000 and 275,000 tons, while other authorities have estimated it at a somewhat higher figure. The editor of the "Butter - and Fettwarenverkehr" strikes the average of 250,000 tons. Accepting this figure as accurate, the prewar margarine consumption was a little less than one-half that of butter, that is, 7.28 pounds per capita against 15.2 pounds per capita.

Production in 1922 has been estimated in the same way, and it seems entirely conservative to place it at 450,000 tons. On that basis butter and margarine have almost changed places since the beginning of the war. Margarine consumption for 1922 would be about 14.7 pounds and butter consumption about 9.76 pounds per capita.

The lowest estimate obtained from the trade was one of 385,000 tons; three of them placed it at approximately 500,000 tons and several estimated production at between 440,000 - 550,000 tons. The Director of one of the Dutch group of margarine manufacturers, who is in a position to

know, states that the production of 1922 was easily double that of 1913, and that for many weeks early in 1923 the Dutch group alone produced over 11,000 tons per week. From this statement it would seem to be safe to place production as high as 500,000 tons.

Included in the accepted figure for margarine consumption in 1922 are several products closely resembling lard, which, although vegetable, are practically pure fats. They are generally supposed to be made of cocoanut and palm kernel fat, are neutral products having no offensive odor or flavor, and are of such excellent quality that the best classes of consumers like them very much. By far the most important are "Kokusfett" and "Palmin", the latter being the trade mark of a large Dutch company. This business was of only minor importance before the war, but during the last year the chief concerns engaged have made large extensions and have done an enormously increased business.

In addition to the above products, considerable quantities of oil are sold for consumption in unmanufactured form especially to replace olive oil which is very expensive.

Changes in the Composition of Margarine.

As is well known, margarine originally was essentially an animal product, but everywhere there has been an effort gradually to use more vegetable oils in its manufacture, a tendency largely attributable to the lower price of the latter material.

Just before the war, Germany had good supplies of animal as well as vegetable margarine, but during the war, and since, the tendency to replace expensive animal fats has been accelerated by greater and greater demand for a low priced product. At present, German margarine is composed almost entirely of vegetable oils.

The margarine industry, which in its earlier stages was dependent on a few materials, now has such a number at its disposal and such an elasticity of production, that it can play one oil against the other, and is particularly well situated to play vegetable against animal oils. In fact, an official of one of the large margarine factories near Hamburg recently said that the Company's formula for the making of margarine was changed every day to meet market conditions.

This new situation in the industry is largely due to inventions and improvements in the manufacturing and refining of oils, many of which were made before the war, but only in later years taken up and perfected to meet demands of the war years and, at present, the changed economic conditions. Among these are processes for the hardening of oils which have assisted greatly in the replacement of animal fats. By better methods of refining, it has also been found possible to use rancid oil for margarine manufacture without injuring the finished product. Inventions for refining new varieties of oils, so as to make them available for margarine, have in many cases given importance to oil seeds, which previously were unknown or used only for industrial purposes. Particularly important are improvements in refining methods for hard oils, such as cocoa nut oil, palm kernel oil, shea nuts, bassia fats, et cetera. At present, cocoa nut oil is sold for edible purposes at 0.1% free fatty acid with no detectible taste or odor and beautifully white in color. It is the strongest single basis for animal fat substitution in margarine manufacture, and palm kernel oil and bassia fats are supplying a good basis for keeping cocoa nut oil at a reasonable price.

Of special importance also are the developments in fish oil. Since the invention for refining and hardening fish oil, Norway in particular has developed a big industry for making edible fat from whales and herrings. German imports of these fats increased considerably just before the war, imports in 1908 amounting to about \$1,400,000 and in 1913 to about \$5,250,000, or a total in the last year of about 53,000 tons. In 1922 the German imports of fish fats amounted to 68,522 tons or nearly as much as the imports of lard.

November 23, 1922, Commercial Advisor Rautenstrauch, President of the German Vegetable Butter & Margarine Manufacture, Cologne, stated the following in making a plea for the extension of this industry in Germany: "Today we know as a fact, that best beef fat can be obtained from most inferior offals of whale oil and other oils, among which also common sardine oil, by eliminating the specific infections through hot steam. By removing furthermore smell and color one gets a neutral raw material, which can be manufactured. Thus one has the possibility of obtaining from cheap raw materials unobjectionable basic stuffs for the manufacture of margarine."

During the war the use of fish oil in margarine was of great importance, and such oils unquestionably are still used, although perhaps to a lesser extent than during war years.

The Hamburg agent for the big Norwegian fish oil refiner De - No - Fa also recently informed the American Agricultural Commissioner in Berlin, that whale and herring oils were much used in Germany for margarine and compound lard, although his business was often curtailed by unfavorable price relationships with vegetable oils and lard.

The following tables show German imports of margarine materials:

Table 27.

IMPORTS OF MARGARINE MATERIAL AND TALLOW, 1912 - 1922.

Item	1912	1913	1920	1921	1922
	Short tons	Short tons	Short tons	Short tons	Short tons
Lard:					
Total	116,978	118,373	136,038	161,162	72,000
From United States..	110,672	111,532	125,790		63,153
Oleo:					
Total	27,067	29,132	5,604	3,277	14,319
From United States..	22,746	21,641	3,320		11,505
From Argentina.....	992	1,377	114		
Premier Jus (Oleo Stock):					
Total	21,655	22,401	8,230	6,245	8,347
From United States..	12,153	9,430	4,256		3,825
From Argentina.....	4,918	7,943	837		2,350
Tallow:					
Total	23,621	29,568	15,954	38,657	34,488
From United States..	3,441	3,913	4,656		9,254
Cotton Seed Oil:					
Total	29,623	17,945	13,729	26,883	2,935
From United States..	22,895	11,022	4,619		410
Fish Oil:					
Total	40,952	55,715	18,631		69,027

Note: Exports of above fats and oils are unimportant.

Table 23.

GERMAN IMPORTS OF MARGARINE MATERIALS AND TALLOW
FIRST SIX MONTHS 1922 AND 1923.

Item	:	1922	:	1923
	:		:	
	:	Short Tons	:	Short Tons
Lard	:	44,221	:	70,729
Oleo	:	8,141	:	4,645
Premier Jus	:	2,982	:	5,182
Tallow	:	15,121	:	17,110
Cottonseed Oil	:	1,325	:	3,308
Fish Oil	:	33,136	:	29,325
	:		:	

Source: Montaliche Nachweise - June 1923.

-FACTORS AFFECTING THE CONSUMPTION OF MARGARINE-

A director of the margarine association recently said that in his opinion consumers had not been won from animal fats but were buying vegetable fats chiefly because of prices. There is undoubtedly a strong inclination to buy genuine animal fats, such as lard, when the premium is not too great, but during the past year, and a half - except during periods of mark stabilization - the price discrepancy has been more than animal fats could overcome.

The increased volume of margarine consumed in post-war, as compared to pre-war years, is clearly in place of the butter that Germany has not been able to produce or import. When more domestic butter becomes available, margarine consumption will undoubtedly be affected.

Retail Trade.

An explanation of the situation and customs in the retail trade with respect to margarine, will help to make clear the strength of the competition offered to animal fat products by margarine type goods.

Of a number of stores retailing fats in various sections of Berlin called upon, some said they were selling more Palmin and Kokusfett than regular margarine, while all reported that they were selling more Palmin and Kokusfett than lard. This gives some idea of the importance, at least in Berlin, of these products, which substitute for lard. These fats are given much more publicity in the fat stores than American pure lard, and always sell a little below lard in price. They have the disadvantage, however, that they cannot be spread on bread, which is one of the important uses of lard, and also that in hot summer weather they are not so solid.

The margarine companies are heavy advertisers, while the American packers here are not. This seems to be the biggest weakness in American selling methods, and a point upon which stress should be laid in the future. One can also buy margarine, Palmin and Kokusfett almost anywhere, even in vegetable and fruit shops, while lard is sold in fewer places and is much more poorly displayed. In Berlin the Bolle concern has almost a monopoly of milk distribution and uses big white wagons around which a large part of the population of the street congregates. The wagons also retail butter, if they have it, and margarine, but they do not carry lard. They sell a trade-mark brand of goods, "Bolle Margarine", and often carry placards stating that margarine prices are being reduced or will be advanced soon. Because of the small margin on milk sales -- the city controls the price -- they place strong emphasis upon this side business.

Before the war the dairy and butter trade would have nothing to do with margarine because of the usual enmity of dairy interests, but it now appears that the disorganized economic conditions have been an element of strength to the margarine industry. With the low consumer's purchasing

power, buyers are obliged to buy "something just as good," and the distributors of dairy products are fostering this trade. As previously noted however, it is likely that this situation will change with increases in the supply of butter.

Wholesale Trade.

Interviews with a large number of people engaged in the wholesale raw or refined oil trade, indicate that these middlemen are also backing the effort to replace animal with vegetable fats. Wholesalers willingly admit that lard gives strong competition to their particular products and causes sales to drop off when margarine prices come too close to the lard prices, but they are constantly on the lookout for cheaper products with which to replace those that are out of line. One large margarine manufacturer, for example, stated that cocoanut oil was then (1923) too high, and consequently, his company expected to greatly increase their importations of an oil seed of the bassia group from Brazil.

The great shortage of German animal fats in 1919, 1920, and 1921, and the fact that government operation of the fat industry at the time demoralized the margarine trade, combined to cause very large imports of American lard, but one year of good management in the margarine business, again in the hands of the owners, has changed matters and given lard genuine competition.

An official of one of the large Dutch margarine concerns made the statement to the American Agricultural Commissioner at Berlin, that the reason for decreased lard purchases in 1922 was not the rate of exchange nor the price relationship between margarine and lard, but lay in the fact that traders could make a greater profit with margarine, since there is al-

ways more speculation in margarine than in lard. Margarine manufacturers have sold their products in marks, and traders, at times when the mark dropped, ordered and bought all the margarine they could, because of the fact that the depreciation of the currency was always faster than the decision of the margarine association to increase prices. Consequently, the traders were able to make large mark profits, when manufacturers prices were suddenly raised.

This was not possible with lard, however, because lard is placed in consignment and stocks belong to Americans. A wholesaler in buying lard, paid the exchange rate of the day, while the American immediately asked his bank to buy dollars and avoided all speculation. Some wholesalers, of course, had good luck in buying lard at the right moment, and consequently made paper mark profits.

The manufacturer just mentioned also said that, although lard is a serious competitor in price, margarine manufacturers do not have any great fear that it will monopolize the fat market, unless American packers enter the German market in a much more aggressive fashion than they have in the past. This suggests that the margarine industry is not in an impregnable position.

MARGARINE INDUSTRY.

Dutch Influence. The strength of margarine and kindred products is to be attributed to a considerable extent to the concentration of the Dutch in the German oil and margarine trade, and to their experience in, and organization for, carrying on the business. Lard, margarine, and similar products, are not purchased solely because of economics laws of price, supply and demand - much depends on organization and selling.

The concentration and importance of the Dutch group is one of the outstanding features of the business. There are said to be about 117 or 118 different margarine manufacturies in Germany, of which number about 22 or 23 are said to belong to the Dutch, yet those under Dutch control produce at least 65 or 70% of the total margarine output (this is readily admitted by a Director of one of the largest Dutch concerns) and are sometimes said to produce 76% of the total.

Opposed to them is the so-called "German Ring". However, it is commonly supposed that the German Ring regularly make price arrangements with the Dutch group.

In addition to these two groups, there are some 20 or 25 companies of lesser importance, who do not make any price agreements with the other groups. They often sell at prices considerably lower than the big concerns, and commonly put out products that are not up to the standards of the others. These products, however, are usually purchased for baking purposes. While these smaller concerns have no distinct organization of their own, it is possible that they may have price agreements in some sections of Germany.

Foreign capital, the greater part of which is Dutch, has likewise invaded the oil crushing industry and according to Lawyer Willemsen this influence is as follows: Of 98 large mills, only 22 are foreign companies, but whereas German mills manufacture 891,926 tons of raw material, the mills under foreign influence handle 988,520 tons. It is also stated, moreover, that foreign influence has lately become greater than these figures indicate.

The Dutch influence in the oil and margarine industry naturally has aroused some antagonism; at one time, foreign-owned companies had trouble with the German laborers, and recently the leading paper of the Majority Socialists has been waging a press campaign against them. However, such

difficulties at present seem of little importance and in general there is no feeling against these concerns. Their appearance is German; they have German managers; the margarine is made in Germany, advertised in German, and the ordinary purchaser cannot distinguish between products.

Many people familiar with the industry feel that Germany actually gains by this Dutch interest. Although England is dominant in the oil and seed trade, Germany is able to draw her supplies through the world-wide purchasing organization of the Dutch and in addition has the advantage of the most scientific methods of oil production, oil refining and margarine manufacture.

Location of the Industry. While the main centres for margarine consumption are the large cities of the industrial sections, it is more economical to ship margarine than raw materials, and the industry, accordingly, has grouped itself largely near the ports of receipt, and the chief markets, for raw material.

The most important ports of receipt are Hamburg and Rotterdam (Holland), and these centres furthermore are well situated for obtaining the large quantities of fresh milk used in margarine manufacture. Consequently, there is a strong concentration of the margarine industry about Hamburg and at points near the Rhine and close to the Dutch frontier, for example, at Goch, Cleve, and Emmerich. Berlin, also, has some margarine factories, and there is a lesser concentration about Nurnberg, because of the difficulties of supplying fresh margarine at such distances in the interior, but the two centers first mentioned supply most of Germany.

This concentration of a large part of the margarine industry on the edges of Germany is of some importance to the American trade because in

warm weather it is necessary to add more animal fats to margarine in order to make it "stand up", and America is the main source of these materials. The comparatively long distance some margarine has to be shipped, and the inadequate and costly facilities for refrigeration in German, give particular reasons for the purchase of American animal fats during the warm summer months.

The feature of greatest significance to the United States, however, is the fundamental change in the type of fat material used in German margarine manufacture. This will be made evident by a brief study of German-American trade in margarine fats and oils.

AMERICAN POSITION IN THE TRADE.

In the first place, American meat products exported to Germany are primarily fats; pure, steam and neutral lard, fat backs, and a few other fat pork cuts comprising the bulk of our pork business, while oleo oil, tallow, stearine and premier jus or oleo stock make up the most important part of our steady trade in beef products. The pork business is almost entirely American, and in the beef products mentioned the United States is singly the most important source of supply. While the United States is, by far, the largest source of animal oils for margarine manufacture, it is not at present an important supplier of vegetable oils. We do export some cotton seed oil, however. (See Table 27)

Of the animal fats imported for margarine manufacture, oleo and Premier Jus or oleo stock are most important, and American supplies of these fats have gained a high reputation, because of maize feeding in the United States. For the years 1912 and 1913 the average import of oleo was about 23,000 tons, of which America supplied 79%; adding premier jus

average imports for 1912-1913 were 50,000 tons two-thirds of which came from the U.S.A. In 1922, with the margarine production doubled, the imports of oleo including premier jus for 1922 amounted to only 22,666 tons or 45% of the 1913 imports.

A reduction in the use of American cottonseed oil is another important change in the source of supply of raw materials. The average imports into Germany in 1912-13 were 23,784 tons. In 1922 total cottonseed oil importations were but 2,935 tons, only 410 tons of which came from the U.S.A. American cotton seed oil is everywhere regarded as of the best quality, but shortage of production in the United States, and world market conditions, have made it almost prohibitive to import this oil, and the oil mills of Harburg (across the river from Hamburg) which formerly crushed cotton seed, have been forced into other lines. It is now commonly believed in the German oil industry that American cottonseed oil will no longer be a serious competitor with other sources of fats.

